



SOLID WASTE & RECYCLING Resource Management Plan 2012



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Thank you to the Solid Waste & Recycling Division and participants who gave input during the online public survey and input sessions.

EXECUTIVE SUMMARY

Guiding Principles

2015 – Diversion Goal = 25%

- Increase residential participation
- Provide recycling to 30% of apartments
- Increase business participation
- Expand drop-off program
- Hire consultant to conduct a rate study
- Create a long range capital plan

2020 – Diversion Goal = 30%

- Increase residential participation to 80%
- Provide recycling to 50% of apartment complexes
- Increase business participation to 50%
- Analyze potential for organic collection and construction & demolition recycling

2030 – Diversion Goal = 60%

- Mandatory recycling
- Collect organic materials
- Construction & Demolition Waste Collection

Solid waste management was initiated by the Greeks as early as 500 BC to protect the environment and public health by quarantining waste to designated locations away from the public. Landfills are still utilized in this way as the primary tool for waste management, but with growing resource constraints cities and businesses alike are beginning to take a more aggressive and integrated approach to treating waste as a valuable resource.

To be successful, the life cycle of resources needs to be addressed from beginning to end. Product producers need to shift towards the dominant use of recyclable materials. Consumers need to make purchasing decisions that take into account the need for recyclable packaging and products and then recycle or reuse those products. Finally, municipalities need to set rate structures that encourage recycling and provide services across all residential and business sectors to ensure appropriate opportunities for recycling or reuse exist.

Indeed, the largest company in the world, WalMart, has adopted such an approach. Walmart's California stores already divert 80% of their total waste, and some stores in the US and Canada have achieved zero-waste status. Despite the variability in systems inputs between businesses and municipalities, WalMart has provided an economic and environmentally sustainable blue print for resource management.

Fayetteville's Solid Waste & Recycling Resource Management Plan incorporates a holistic approach that includes efficient collection of waste, a plan for expanding recycling opportunities, advocacy for producer responsibility of products and packaging, and education of Fayetteville citizenry to take greater ownership of their role in resource management.

Recommendations developed through this process are integral in advancing Fayetteville towards a reduced dependence on landfill disposal by closing the loop on a greater percentage of product life cycles. This in turn will lessen long-term liabilities and increase economic opportunities in material reuse markets while reducing impacts on local ecosystems. These recommendations include a capital improvement plan that captures long-term needs, and a rate structure to promote greater waste diversion by utilizing existing recycling markets. It also relies on the promotion of public and private sector take-back programs as well as increased funding for education initiatives to meet the diversion goals that were adopted.

- Protect public health and the environment through an efficient, effective, and transparent resource management plan.
- Expand and improve Fayetteville's diversion rate to 30% by 2020 and 60% by 2030
- Educate and advocate for greater recycling, reuse, and conservation of materials in homes, apartments and businesses



CITY COUNCIL RESOLUTION

Placeholder text for City Council Resolution.

STRATEGIC ANALYSIS OF SOLID WASTE & RECYCLING

I. Introduction

The City of Fayetteville's Sustainability & Strategic Planning Department was tasked to produce the following two products:

1. An analysis of the City's Solid Waste & Recycling programs, and
2. A long-range Resource Management Plan in collaboration with the Solid Waste & Recycling Division

What is a Solid Waste Resource Management Plan?

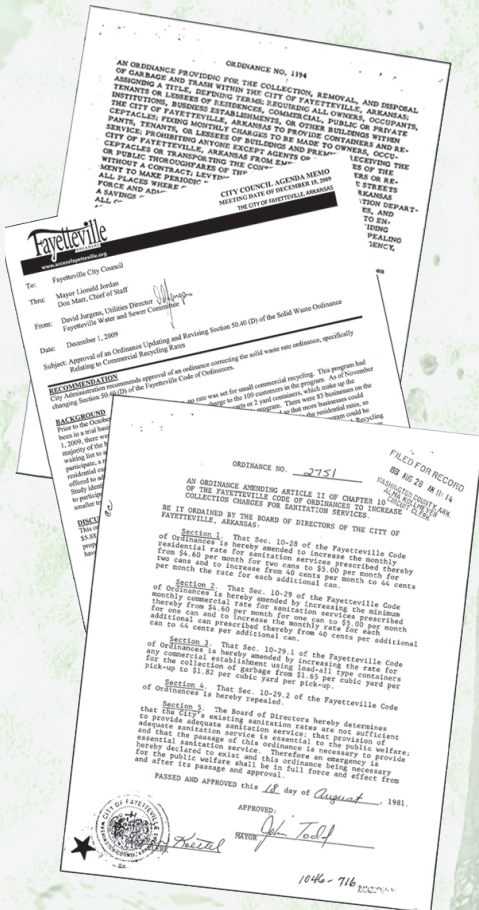
The Solid Waste and Recycling Resource Management Plan (SWRRMP) is a long-range blueprint for waste reduction and smart resource use. This SWRRMP covers all forms of solid waste that is collected by the City of Fayetteville. This plan is intended as a guide for the community to utilize as we focus on waste diversion through recycling and reuse. The plan will lay out goals, action steps and timelines developed to positively impact the economy and the community through efficient and effective resource conservation.

II. Current Operations & Relevant Statistics

The Solid Waste and Recycling Division operates according to the policies and procedures adopted by City Council and located in Chapter 50: Solid Waste and Recycling of the Fayetteville Code. The purpose of this chapter is to regulate the operations and functions of the division through clearly defined procedures for solid waste and recycling collection and disposal. Additionally, Chapter 50 of the City Code is the location of the City's solid waste and recycling rate structures.

A) History of Solid Waste & Recycling Programs in Fayetteville!!

The City of Fayetteville's Solid Waste and Recycling Division has grown and evolved since its inception in 1959. Initially, the City provided only trash pick-up for disposal, but has evolved to offer a wide variety of solid waste and recycling services. The following are some important and interesting dates for the Solid Waste and Recycling Program in Fayetteville:



1959 - Ord. # 1194 - The City of Fayetteville first created a "Sanitation Department" with Ordinance # 1194 in 1959. The newly created Sanitation Department was under the direction of the Mayor and a Sanitation Committee made up of members from the City Council. This ordinance established the first rate structure with a base rate for single family homes with a bi-weekly pick up at \$1.00/month.

1968 - Ord. # 1619 - In 1968 the City put the supervision of the Sanitation Department under the jurisdiction of a Sanitation Superintendent. Additionally, amendments were made that allowed property owners to contact the Sanitation Department to come by and pickup brush and limbs, which was not to be construed with bulky item pickup for items such as appliances and furniture. This was also the first code that prohibited the burning of trash within the City limits.

1991 – Ord. # 3581 – This ordinance amendment allowed residents to set trash out for collection in plastic bags. Previous ordinances had required all trash to be placed in containers.

1993 – Ord. # 3755 – Allowed residents to bring brush and limbs to the City composting facility for a flat rate charge of \$3.50 per loose cubic yard for disposal.

1994 – Ord. # 3841 – This ordinance created a Solid Waste Diversion Plan and amended Chapter 50: Garbage and Trash of the Fayetteville Code to mandate once a week pickup and the first curb-side recycling program that allowed residents to place recyclables in blue plastic bags for pickup.

2002 – Ord. # 4415 – Required the use of city owned garbage containers for all single family residential solid waste and recycling material.

2003 – Implemented Pay-As-You-Throw garbage collection to encourage recycling

2005 – Ord. # 4765 – Mandated that residential solid waste rates be adjusted annually to the Consumer Price Index.

As shown, Solid Waste & Recycling programs and ordinances have evolved over the years to meet the demands of a growing and changing population. In order to implement the goals and objectives of the Solid Waste and Recycling Resource Management Plan periodic amendments to Chapter 50 will be required.



Fayetteville's Solid Waste and Recycling Operations Center



Material Recovery Facility

B) Current Solid Waste & Recycling Collection Operations

The Solid Waste and Recycling Division operates as an enterprise fund and does not receive sales tax or General Fund revenue. The fund maintains operations through the fees collected for the waste and recycling services provided and encompasses seven main programs:

- 1) Administration- Program 5000
- 2) Commercial Waste Collection- Program 5010
- 3) Residential Waste Collection- Program 5020
- 4) Drop Box Program- Program 5030
- 5) Transfer Station- Program 5040
- 6) Recycling Program- Program 5060
- 7) Composting program- Program 5070.

Currently the Division has 57 employees and 58 fleet vehicles that provide the collection, transportation, disposal, processing and marketing of solid waste and recyclables generated within the City of Fayetteville. The Division also provides programs such as bulky waste pick up services, composting and recycling drop off centers.

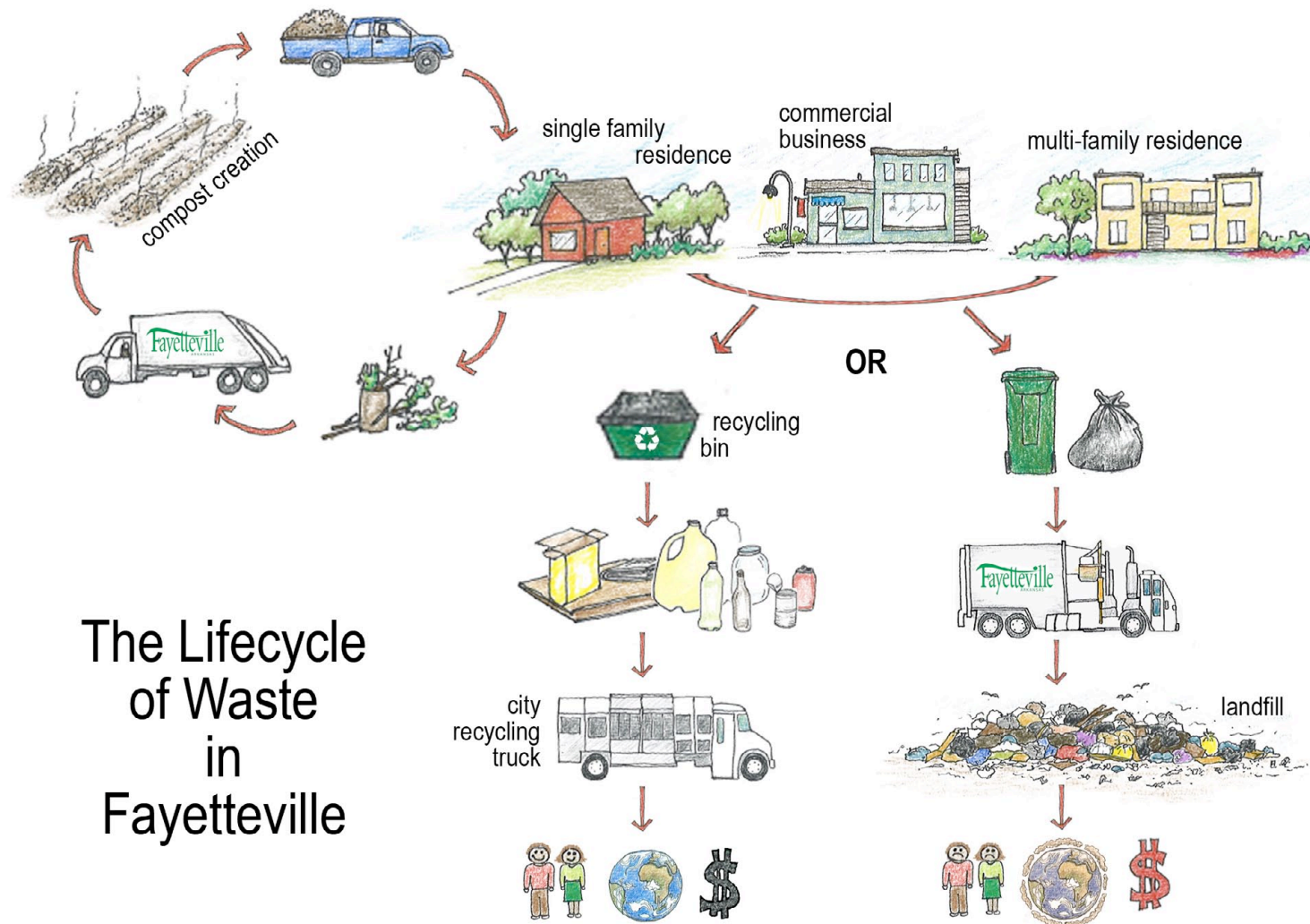
Solid Waste Collection Operation

The City owns and operates a Material Recovery Facility and Transfer Station at the Happy Hollow Rd. facility. All material collected by the Solid Waste Division is processed at this facility where it is either bundled for recycling, added to the City's yard waste compost program or packaged for transfer to the regional landfill located in Tontitown.

The City of Fayetteville is required by state law to ensure that waste generated in the city limits of Fayetteville is properly disposed of. This requirement allows the City to manage franchise fees, costs of service and provide a myriad of additional programs. This control also allows the City to better manage the waste stream with an emphasis placed on diverting waste from the landfill.

The City sent 50,768 tons of solid waste collected from residential & commercial services, the dropbox, (roll off container program), and transfer stations to the landfill in 2010. This accounted for 85% of the total waste stream collected and processed at the City's Material Recovery Facility (MRF) and Transfer Station. Of the remaining 15% of materials, 9% were recycled and 6% were composted.

The following diagram illustrates the life cycle of waste in the City of Fayetteville:



32 gal.	64 gal.	96 gal.
\$9.07	\$13.85	\$19.66

Residential Solid Waste Cart Rates

18 gal.
\$5.88

Residential Curbside Recycling Rate



Pay-As-You-Throw trash carts

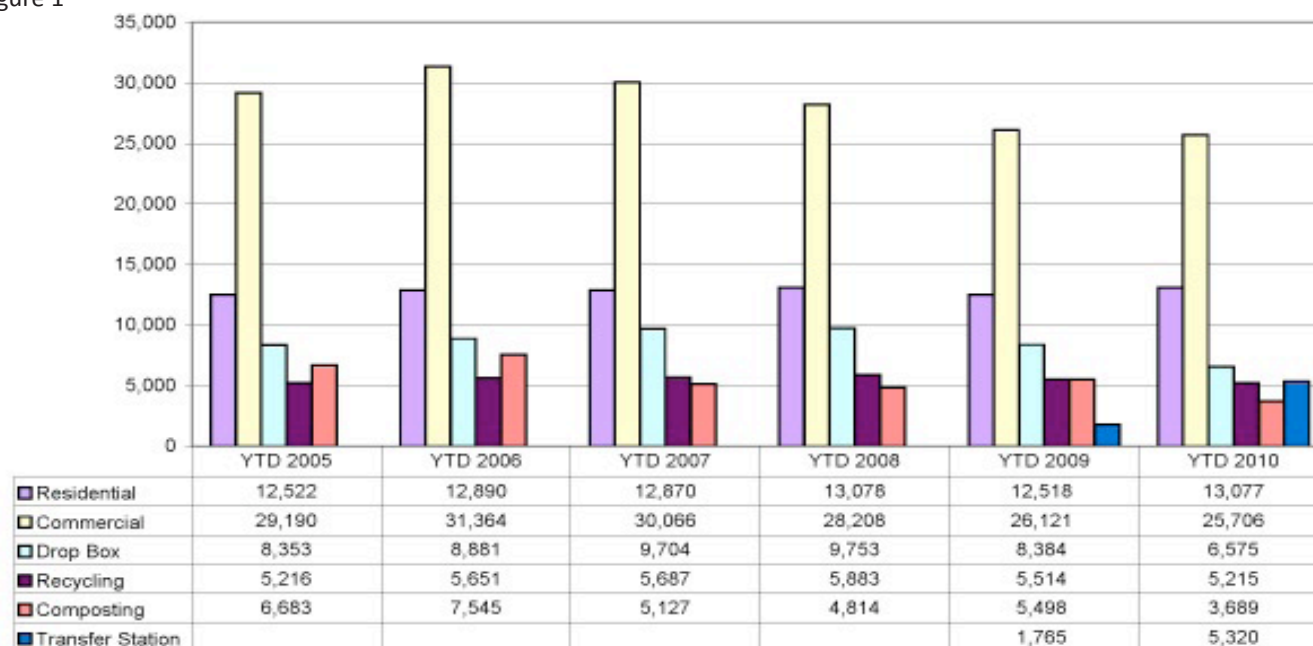
C) Waste Collection & Diversion Programs

Residential Collection Operations

Single-family households and a small number of duplex and multi-family households are collected through a cart based Pay-As-You-Throw (PAYT) automated trash program. PAYT programs are endorsed by the EPA as effective programs designed to reduce waste and promote recycling. Utilizing different sized carts encourages waste reduction habits by placing a financial incentive to recycle more and waste less. In 2010 there were 19,662 residential solid waste carts. The current rates for solid waste carts were set in 2007 and are shown to the left:

Figure 1 below illustrates the number of customers participating in the PAYT program with the tonnage of residential waste and recyclables shown. (Note: The University of Arkansas is not included in these totals.)

Figure 1



The City of Fayetteville operates a curbside sort recycling program for its approximately 20,000 single family residential and duplex customers. This program collects ten different materials for recycling:

aluminum, plastic bottles (HDPE, PET) steel cans, green glass, clear glass, brown glass, mixed paper, chipboard, and newspaper. In 2009 the City hired R. W. Beck to conduct a study evaluating the efficiency and effectiveness of the current residential recycling operations including: material collection and collection efficiency, performance, staffing and equipment and route operations. In 2007 it was estimated that on a per household basis the City's residents recycled 587 pounds of material annually with a participation rate of 56% and at a cost to the City of \$5.88 per household. R. W. Beck assessed the City's residential recycling rate as one of the highest in Arkansas, Texas and Oklahoma. The curb sort program has minimal contamination because the drivers inspect the material at the time of collection and leave non-recyclable and contaminated material in the bin.

Multi-family Residential Recycling Program

In the fall of 2011 the City began a new apartment recycling program targeting multifamily complexes containing 250 or more units. This program utilizes three containers that can collect six different commodities. The containers are located at a specific apartment complex the same day each week. The containers are then moved the following morning to the next apartment complex. In this way, one set of three containers will be able to service four apartment complexes per week. The City anticipates serving all complexes with 100 or more units by 2020. This program will effectively provide on-site drop-off recycling to 50% of all apartment residents representing 25% of Fayetteville's total population.



Apartment Recycling Container

Existing Commercial Recycling Program

In 2009 the City established a commercial recycling program designed for small businesses in addition to the cardboard and paper recycling programs that were already in place. The City provides each participating business with up to five 18 gallon recycling bins for a flat charge of \$5.88 plus the cost of each bin. The City utilizes its residential curbside recycling equipment and staff to collect and sort the materials for processing. The City estimates that there are approximately 3,000 commercial business enterprises located in the City, and at the time of this analysis a total of 190 businesses were participating. A true picture of the commercial sector of the City will soon be available with the implementation of the City wide business registry. Data collected should be utilized by the Solid Waste and Recycling Division in order to better target potential commercial recycling customers for inclusion in this program. The recently implemented commercial recycling program will need time to get established while working on expanding the customer base. Significant investments in educational outreach will be necessary to achieve large diversion percentages from the commercially generated waste stream.



Recycling Center

Drop-Off Program

The City provides a 24 hour drop-off recycling center located on Happy Hollow Rd. adjacent to the MRF and the transfer station. Recyclables are source separated and collected in roll off containers and are then hauled as needed to the MRF to be processed with materials collected from the curb side program. The City is in the process of building a new drop-off recycling center on the west side of town at the Westside Wastewater Treatment Plant, slated for completion in the fall of 2012, and there have been discussions to locate an additional drop-off facility in North Fayetteville. The strategic placement of smaller drop-off centers in commercial areas like supermarkets could provide a viable alternative for residents and businesses in locations that are currently not offered recycling services.


D) Franchise Agreements

Fayetteville's Solid Waste Franchise agreements are contracts allowing private companies to collect and properly dispose of specific types of waste in the City of Fayetteville. Currently this includes a variety of waste streams from commercial to hospital waste.

Section 50.02 in Chapter 50 of the City Code gives the City of Fayetteville exclusive rights to haul and properly dispose of all solid waste and recycling within the city limits of Fayetteville. This ordinance ensures that a public entity, which is open to requirements of transparency and governed by elected officials, controls the destination of all waste generated in the community. It also allows the City of Fayetteville to plan and operate more strategically than many cities across the country to systematically divert waste from going to the landfill.

As a comparison, Austin, Texas and Atlanta, Georgia each recently released “zero-waste” plans for their communities, but their own ordinances only allow them to govern waste that is generated in the residential sector. City officials in these cities cannot effectively regulate commercial or multi-family waste streams nor can they transparently account for the end use of recyclable materials in each of these sectors.

Fayetteville, on the other hand, recently passed Resolution 19-11 which requires transparency in the handling of recycling commodities by posting information on the City's website about what was collected and where the end market was. This gives residents and businesses confidence that what is being collected



is indeed being recycled.

Within certain sectors, the City has contracted with private haulers allowing them to collect those items that the City was incapable of collecting. In the past this included some commercial entities as well as specialty items such as hospital and industrial waste. Fees are collected from these companies, but it has been difficult to determine the final destination of these waste products due to lack of public information.

In some instances, the City's Internal Auditing Division found private contractors were not compensating the City appropriately for the amount of waste that was being collected. This is the primary reason why the City's Utilities Department is developing new guidelines for what is collected through franchise agreements to ensure that proper controls are in place. The new franchise agreements are expected to be complete by the spring of 2012.

E) Financial Analysis

The City of Fayetteville's Solid Waste & Recycling Division is an enterprise fund which means revenue generated from services must cover its annual expenses as well as long-term capital costs. The Division does not receive subsidized funding from the City's General Fund or a designated tax of any kind. Prior to 1999, the Division had required a subsidy from the City's Sales Tax Capital Improvement Fund to keep it solvent, but over the past decade Solid Waste & Recycling staff has focused diligently on creating a stand-alone division that can operate in a sound financial position.

The Division's primary responsibility is to provide collection services to residential and commercial customers as well as operate the solid waste transfer station. This comes in the form of solid waste and recycling collection as well as "bulky" waste and yard waste. When a business or resident occupies a building in Fayetteville they are required to have a solid waste account with the City or one of the private haulers.

Below are three areas of interest that could have substantial impacts on the operations and perception of the Solid Waste & Recycling Division:

Solid Waste & Recycling Accounting

For residential customers the solid waste fee covers costs for garbage, recycling, bulky waste, and yard

waste collection. The City's progressive Pay-As-You-Throw program encourages customers to produce less waste by providing a choice in cart size; the smaller the bin the less the customer pays, as illustrated in the image below:



Despite the solid waste fee covering expenses for these services, under the current accounting system all revenue generated from the rates are attributed to the solid waste account, thus showing a large end of year surplus in this account and huge year end losses attributed to recycling and yard waste.

A closer look at the 2010 Statement of Revenue & Expenses shows a level of detail that is often not highlighted in public discussion. In 2010, residential solid waste collection expenses totaled \$1.72 million while residential recycling collection cost \$2.1 million; about \$400,000 difference. Revenues generated from each of these programs, excluding the solid waste fee, were \$119,000 (for extra bag charges) and \$466,000 (recycling commodities sold on the market), respectively. Using these figures, the recycling collection program cost about \$40,000 more than solid waste residential collection in 2010. With the 2011 increase in tipping fees and the scheduled increase over the next two years, this will more than offset this separate cost.

Households pay for these services through what is termed the "Solid Waste Fee" which generated \$3.27 million in 2010, but attributing that fee solely to residential solid waste collection is misleading. The Solid Waste & Recycling Division's cost per month to collect each individual cart that is placed throughout Fayetteville is approximately \$6.96. This cost includes personnel, materials, landfill tipping fees, fleet costs, etc; essentially everything it takes on a day to day basis to provide the service. As you can see in the chart to the left, the lowest amount a resident can pay is \$8.75 for the 32 gallon cart. The additional fees above the base cost of \$6.96 are to cover expenses for the services listed above, and to serve as a penalty under the PAYT system for producing excessive waste . A portion also goes to subsidize the commercial recycling program. For years the recycling program has been portrayed as a revenue loser and is often considered by many to be

32 gal.	64 gal.	96 gal.
\$9.07	\$13.85	\$19.66

Residential Solid Waste Cart Rates

The recycling truck fleet is on an eight year rotation and will need to be replaced in the next three to four years. These types of capital decisions also set the policy for how recyclables are managed in the community.



Current recycling truck

something that must be done to appease residents. It is our contention that waste and recycling collection are both demanded and expected by residents, and that a standard “service fee” should reflect this fact. Furthermore, as recycling becomes available to more multi-family dwellings and commercial entities a PAYT-style service fee should also be applied to cover the costs associated with providing these services.


This rate description will not only better capture the reality of the fees being charged, but also provide greater incentive for the customer to recycle. After all, when the City collects “garbage” it has to pay a tipping fee at the landfill, but when it collects recycling the City actually receives revenue for this commodity on the open market. The City also avoids greater long-term costs associated with landfill closings and cleanups.

Capital Plan & Policy Impacts

A close look at the 2010 Statement of Revenue & Expenses shows a level of detail that is often not highlighted in public discussion. In 2010, the residential solid waste collection expenses totaled \$1.72 million while the residential recycling collection cost \$2.1 million; about a \$400,000 difference. Revenues generated from each of these programs, excluding the solid waste fee, were \$119,000 (for extra bag charges) and \$466,000 (recycling commodities sold on the market), respectively. Therefore the residential recycling collection program cost about \$33,000 more than the residential solid waste collection program did in 2010. In 2011 an increase in the solid waste landfill tipping fees should actually tip the balance in favor of the City’s recycling program costing less than the residential solid waste program.

	Residential Solid Waste Collection	Recycling Collection
Collection Costs	\$ 1,720,000	\$ 2,100,000
Revenues Generated	\$ 119,000	\$ 466,000
Net Program Cost	\$ 1,601,000	\$ 1,634,000

Households pay for these services through what is termed the “Solid Waste Fee” which generated \$3.27million in 2010. However, attributing this fee solely to residential solid waste collection is misleading. The Division’s base cost per month to collect each individual solid waste cart is approximately \$6.96. This cost includes all personnel, materials, landfill tipping fees, fleet costs, etc; essentially everything it takes on a day to day basis to provide the service. As you can see in the chart to the left, the lowest amount a resident can pay is \$9.07 for a 32 gallon cart. The additional fees above the base cost of \$6.96 are to cover expenses for recycling, bulky waste pickup, yard waste, and to serve as a penalty under the PAYT system



for producing a greater amount of waste. A portion of the fees above the base cost also goes to subsidize the commercial recycling program.

For years the recycling program has been portrayed as a revenue loser that exists only because a significant portion of the community supports and expects the program. The expectation for these services to exist should be reflected in a more equitable standard “service fee” that would cover the base collection costs for both programs. Furthermore, as recycling becomes available to more multi-family dwellings and commercial entities a PAYT style service fee should also be applied to cover the costs associated with providing these services.

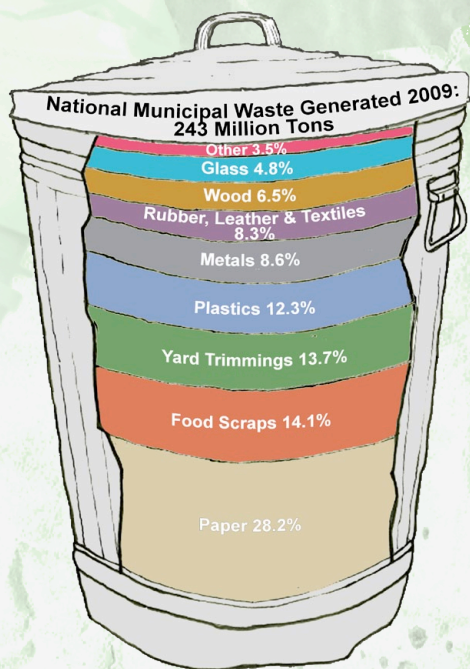
A standard service fee would not only better capture the reality of the fees being charged, but also provide greater incentive for the customer to recycle. After all, when the City collects “garbage” it has to pay a tipping fee at the landfill, but when it collects recycling the City actually receives revenue for this commodity on the open market. In this way, the City may also avoid greater long-term costs associated with landfill closings and cleanups.

Rate Study

It has been over a decade since a Solid Waste and Recycling rate study was performed and adopted. Once the capital plan is complete it is staffs recommendation that a rate study be performed with the goals of the Solid Waste & Recycling Resource Management Plan in mind. This rate study should reflect the necessary service fees required to provide solid waste and recycling for commercial, residential, and multi-family sectors as well as the current and future capital costs associated with each.

An updated rate study has the potential to significantly increase the waste diversion rate for the City. For example, a multi-family apartment complex could choose to participate in the new recycling program, be wildly successful, and eliminate the need for twice a week dumpster pick up. Under the current rate structure it is not possible to reduce the fee even if the City had to make one less stop per week. A new rate structure should incorporate the cost for both dumpster and recycling programs, and if set up like the residential PAYT program, provide a financial incentive for complexes to achieve once a week collection or eliminate the number of dumpsters at the complex.

Another example would be to slightly amend the current residential PAYT program. The City has reached a plateau of around 56% participation from residents in the residential recycling program. A new rate that



Municipal waste generated in the U.S. in 2009



Apartment recycling outreach efforts

increases the difference in cost between the 32, 64, and 96 gallon carts, with the larger carts costing significantly more, would provide greater incentive for residents to recycle, thus saving on landfill tipping fees and increasing the revenue generated from recycling commodity sales.

III. Advanced Recycling Operations & Opportunities for Partnership

A) Current Practices in Waste Diversion

The United States generated 243 million tons of municipal waste in 2009, most of which was material that was recyclable, but may never be recovered. It is timely that the nation is experiencing a watershed moment of increased awareness of limited natural resources, global increases in consumption and waste production and the need for more responsible disposal. Citizens and local governments are pushing for sustainable practices in recycling education and outreach, merchandise production, packaging, and disposal, all of which will advance recycling technology and lead to expanded materials markets. Locally the closure of landfills has increased the cost of solid waste disposal, pressing municipalities to search for alternatives.

Education & Outreach

The City of Fayetteville has had a Pay-As-You-Throw recycling program for almost a decade. In the past two years, the Solid Waste & Recycling Division has launched new curbside recycling opportunities for small businesses, recycling for large apartment complexes, and expansions of drop-off sites. All of these programs have the potential to improve the City's diversion rate, but only if the community utilizes them. In the past three years participation in the residential recycling program has hit a plateau of 56%. The commercial program has only 190 of the approximately 3,000 potential businesses participating and the apartment program has just recently launched.

Investments will need to be made in the necessary capital equipment and associated staff to make these programs work, but without consistent outreach, education, and a wide recognition that these programs exist the programs could flounder. The City's Waste Reduction Coordinator is often expected to perform this work, but his job description also requires plan review for new developments, working with brokers to sell the commodities, budget development and analysis, data collection and reporting, grant writing, and

The total value to the City of Fayetteville for each ton recycled is \$125.04

web maintenance for the entire division. It is simply not possible to devote the amount of time it would take to have an effective outreach and education program.

Staff recommends creating a full-time education and outreach position for Solid Waste & Recycling to focus entirely on account development and increasing participation. In short, this person would focus on growing the business of recycling, which is a critical component of the Solid Waste & Recycling Resource Management Plan.

The eight year average for recycling commodity sales in Fayetteville is \$91.27 per ton. Taking into account the landfill tipping fee of \$33.77 per ton and the total value to the City of Fayetteville for each ton recycled is \$125.04. If this new position were able to hit the Plan's increased residential participation goal of 14 percent, it would more than pay for itself during that time. Achieving other diversion goals in business and apartment recycling would elevate the value of a full time educator even further.

This position would enable the City to better engage individual businesses, neighborhoods, apartment complexes and others to ensure awareness of the existing programs and assist them in participating. A recycling educator would also be able to emphasize the importance of communication and appropriate signage.

Example of informational flier handed out to businesses by recycling educators.





Single stream MRF facility

Single-Stream Recycling

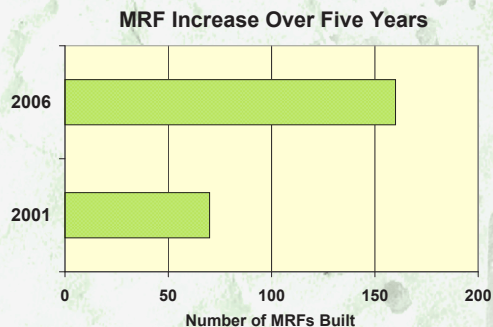
Many of the technological advancements have been developed to make it easy for the customer to dispose of recyclable materials responsibly and to increase the efficiency of processing materials bound for the commodities markets. The overwhelming trend for communities is toward single-stream recycling programs and facilities. Single-stream recycling is a system where all recyclable materials are put into a single receptacle at the curb and are then picked up mechanically in a standard solid waste truck and taken to a MRF where they are separated, processed and bailed.


As part of their 2009 study, R.W. Beck compared existing recycling programs with single- and dual-stream options. The study ultimately recommended that the City seek public-private partnerships to develop a single-stream MRF for these primary reasons:

- Both dual-stream and single-stream collection systems would provide collection cost savings over the status quo system. Annual savings in the dual-stream scenario would be \$197,024 over the status quo, and annual savings in the single-stream scenario would be \$240,953 over the status quo.
- Single-stream recycling with rolling carts provides greater potential to maximize material recovery and the recycling rate in the City.
- Single-stream provides greater opportunity and flexibility to service multi-family and commercial customers
- Automated recycling vehicles provide greater operational efficiency as well as increased safety for recycling drivers.

At this time, cities that are achieving the highest diversion rates around the country (Madison, Boulder, San Francisco, etc) are all utilizing single-stream technology.

The primary reasons communities can be hesitant to switch to single-stream are due to initial facility and equipment costs, risk of glass contamination in fiber, and increased processing residue or contamination. R.W. Beck estimated that the residue going to a landfill from a single stream MRF is 13% of the total volume processed. In some instances, communities that implement single-stream do not collect glass at all in order to avoid contaminating fiber which sells on the commodity market at a higher rate than most recyclables. At the national level there is an ongoing discussion of commodity prices that are impacted by contamination





rates, end markets locations and transportation costs. The City's Solid Waste & Recycling Division staff has voiced many of these same concerns. Local residents opposed to single stream MRFs cite poor working conditions for employees and a perception that the diversion and contamination data is skewed by the operators. In spite of these concerns, communities and private companies continue to build single-stream MRFs at a rapid pace with the number rising from 70 in 2001 to 160 in 2006. In the past year Asheville, North Carolina, Olathe, Kansas, and Little Rock/North Little Rock are a few of the cities that have made this change as well.

The communities that have switched to single stream MRFs cite many reasons. The biggest being the convenience and resulting increased recycling participation and diversion rates. According to Steve Dunn, regional vice president of Houston-based Greenstar Recycling, "We have seen volumes increase by 50 to 300 percent in markets where we have introduced single stream...Customers respond quickly to the convenience of putting all recyclables into one bin." The convenience for the customer attributes to an increase in the amount and type of materials collected, an increase in the number of residences and businesses serviced and an increase in the automation and speed of material pick up. Essentially, the efficiencies of the system outweigh any increase in contamination rates.

Staff did identify a demand for expanded recycling services through public input sessions and online surveys. However, the organized vocal support from businesses, apartments and single family residents necessary to move to a single stream system does not exist at this time. These factors coupled with a lack of staff buy in and vocal opposition to single-stream from a small but active constituency renders this concept unfeasible. Therefore, staff does not recommend moving towards a single-stream solution in the near term. However, in order to develop more aggressive long-term waste diversion goals in the future, single-stream recycling will likely need to be reconsidered.

Technological Advances

The Solid Waste and Recycling industry is evolving rapidly in response to new technologies that are being developed or adapted in order to increase efficiencies in collection and disposal.

Municipalities are increasingly using internet technologies and more specific survey data to gain information on customer preferences and satisfaction with existing or proposed services. Online and drive-by surveys have become commonplace and are replacing the mail out surveys that have been widely used in the past. An important consideration in the design of surveys is to include the collection of the

property address in order to geographically locate the data being collected. Survey data that is not tied to a geographical location is useful but inferior because it lacks the spatial component necessary for in depth analysis of block by block recycling tendencies as well as impacts arising from the built environment such as vehicular access or relationships with surrounding land uses.

A technology that has been recently developed and is beginning to be used called Integrated Solid Waste Disposal Management Systems is where the integration of communication technologies such as radio frequency identification (RFID), global positioning system (GPS), general packet radio system (GPRS), geographic information system (GIS) with a camera are constructed to develop a solid waste monitoring system. The aim is to improve customer service, better manage emergency cases and estimate the amount of solid waste without any involvement of the truck driver. The system consists of a RFID tag mounted on the bin, a RFID reader on the truck collection arm, GIS as map server and a compatible data base, control station and web-server. The tracking devices mounted in the trucks collect location information in real-time via the GPS. This information is transferred continuously through GPRS to a central database. The users are able to view the current location of each truck in the collection stage via a web-based application, and thereby manage the fleet. The trucks positions and trash bin information are displayed on a digital map, which is made available by a map server. Thus, the solid waste of the bin and the truck are being monitored in real time using the developed system.

B) Emergent Trends in Solid Waste & Recycling

Food Collection

According to the Environmental Protection Agency, 14 percent of a municipality's waste stream is made up of food scraps. This amounts to a staggering 34 million tons each year in the United States.

The most obvious and efficient ways to reduce this number is for people to decrease their levels of food waste, and for people with yard or garden space to start composting at home. However, this might not be practical in areas with high density or commercial land uses. Cities that have advanced recycling programs with high diversion rates are starting to collect food waste at the curb for municipal composting programs. The processed compost is sold back to consumers for gardening applications, similar to Fayetteville's yard waste program. In these programs, users put food scraps at the curb in a designated bin and an automated truck collects the food waste each week. The scraps are taken to a designated site and



Food compost



Anaerobic digester system



E-waste

composted in a traditional manner where piles are turned over as they decompose.

Some municipalities and private companies utilize another technology that involves anaerobic digestion. Anaerobic digestion is a process where microorganisms decompose organic materials. The results of this process include methane which can be burned to produce energy, and an organic product that can be used as fertilizer. In the case of the East Bay Municipal Utility District near San Francisco, they are using food waste collected to help power one of the local wastewater treatment plants. Locally, WalMart has utilized a company based in southwest Missouri to collect and compost food scraps, and is also monitoring a recent anaerobic digester pilot project in the area.

The City entered into a pilot composting program with Sam's Club, lasting from 2008 to 2010, but is not yet equipped to begin a food collection program. The complexity in food composting comes when meat and cheese products enter the waste stream, contributing to the odor of a facility, and making traditional large volume composting more difficult. In the future, Fayetteville should be poised to take advantage of developments in the realm of composting, especially as new technologies are made available and opportunities for partnerships emerge.

E-Waste

With the exponential growth in electronics over the past decade, E-waste is quickly becoming one of the most complex issues in the solid waste and recycling field. Because of the presence of harmful chemicals in electronics, there are stricter handling guidelines placed on this type of waste. These chemicals also make it difficult to provide conventional recycling opportunities such as curbside collection.

To date, the region has done a good job of providing opportunities for E-waste collection. A regional round-up at Arvest Ballpark has been successful over the past two years, and Washington County has a household hazardous waste facility that can be utilized year around.

The complexity of recycling this waste stream and the growing volume will continue to require consistent outreach and education in order to keep residents informed about the harmful effects of landfilling electronic waste.

Increased Producer Responsibility

Take-back programs give manufacturers the physical responsibility for products and/or packaging at



Plastic lumber

the end of their useful lives. By accepting used products, manufacturers can acquire low-cost feedstock for new manufacture or remanufacture, and offer a value-added service to the buyer. Most take-back programs in the U.S. are voluntary, while legislation in many European countries require manufacturers take responsibility for waste costs incurred by products and packaging.

Good candidates for take-back programs include products with packaging that is reusable or recyclable, e.g., disposable cameras; products that become obsolete rapidly or have limited lifespan, e.g., furniture, electronics and appliances; products that contain significant material or energy value after use, e.g., power tools and batteries; and products that contain valuable components that can be refurbished and reused, e.g., photocopiers and printer cartridges.

Glass to Plastic


Another trend around the world is the conversion from glass containers to plastic containers. Just a few years ago, ketchup bottles, mustard bottles, and other common household items were almost exclusively purchased in glass containers. Today, manufacturers are quickly transforming to plastic packaging materials because of the lighter weight for shipping and the durability of the container.

Plastic bottles are a valuable commodity when sold on the recycling market, but ultimately plastic containers are “down-cycled” into other materials such as carpet, fleece, or plastic lumber. Once plastic is in this form it is very difficult to recycle into another use. Glass, on the other hand, can be melted and turned back into a glass container repeatedly. Recently the City has contracted with Ripple Glass of Kansas City, which is purchasing the glass and recycling it into fiberglass insulation.

Waste to Energy

Some communities around the country are beginning to enter into “waste to energy” agreements as opposed to sending this waste to the landfill. Essentially, a company will sign a contract to accept specific types of waste (sometimes commodities that could be recycled) and then either convert these items into a fuel source, such as oil, or simply burn the waste to create electricity.

A local example is the recent opportunity for the City of Fayetteville to accept #3-7 plastic bottles and containers. The #3-7 plastic bottles and containers will be collected and shipped to a company in Oklahoma. The company will process the plastics and turn them back into oil that can then be burned for energy and



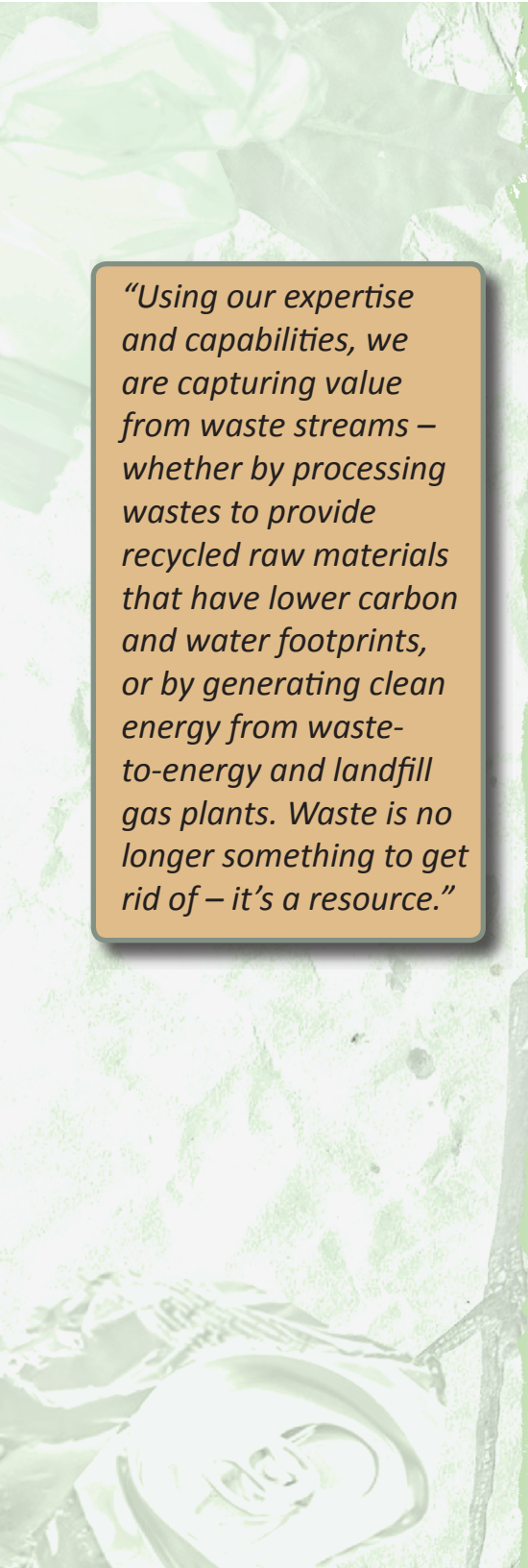
polyethylene resin. Currently, all of these #3-7 plastics are going to the landfill so this is a step in the right direction.

Depending upon the resulting pollutants from this process, “waste to energy” may be a better option than the landfill, but not on the level of recycling the product into something that can be used again. Because of the in-between nature of waste to energy, the trend among peer cities is to not count this as part of a City’s diversion rate.

Zero Waste

A number of cities have produced zero waste plans or adopted zero waste goals in the last five years. Existing zero waste plans include actionable items that will achieve anywhere from 75 – 90 percent diversion in the short and medium term. Even the most aggressive cities include long-term goals reliant upon technological advances that haven’t occurred yet or “increased producer responsibility” which requires businesses or manufacturers to convert products that are currently not recyclable into materials that are. As mentioned earlier, some communities do not have authority over the entire municipal waste stream so the plans can be limited to what those municipalities do control.

Striving for zero waste is still a very laudable goal even while relying on future changes in the market place to address those items that aren’t recyclable today. Eric Lombardi, the Executive Director of Eco-Cycle in Boulder, Colorado, says “If we can get to 90 percent, we have changed the world significantly, and we’ll have that discussion about the last ten percent then.” At \$125.04 per ton, there is an economic argument for Fayetteville to move in this direction as well instead of transferring the value of these commodities over to landfill owners. Factoring in long-term costs associated with landfill cleanup and the lack of options when choosing landfills, the argument for waste diversion becomes even more attractive. Because of the evolving nature of resource management , staff recommends a reassessment of process and goals every five years.



“Using our expertise and capabilities, we are capturing value from waste streams – whether by processing wastes to provide recycled raw materials that have lower carbon and water footprints, or by generating clean energy from waste-to-energy and landfill gas plants. Waste is no longer something to get rid of – it’s a resource.”


C) Opportunities for Partnership

This quote didn’t come from an environmental non-profit or think tank; it came from David Steiner, the CEO of Waste Management, a Fortune 200 company with revenues exceeding \$13 billion, over 50,000 employees, and which recently moved its national Sustainability Solutions Center to Northwest Arkansas. Global population just topped the 7 billion mark which is almost three times the number of people that existed in 1950. The public and private sector are beginning to understand the resource constraints that come with this growing demand, and are reacting accordingly. For Waste Management this means evaluating the waste they collect everyday, which they are now estimating at \$8-10 billion annually or an additional 60-75 percent of their total revenue stream.

For the City of Fayetteville, these constraints bring similar opportunities. The City is fortunate because it is required by the state of Arkansas to ensure that waste generated in Fayetteville is properly disposed of. As resources become even more limited, the value of the recyclable materials in this waste stream will only go up. At the same time, the City can determine how the waste is reused or recycled instead of relying on market demand to dictate where it goes. For example, turning ‘waste-to-energy’ is becoming economically feasible locally with the opportunity for converting #3-7 plastics to oil. Private sector companies will be more apt to push waste to energy for all commodities if there is a higher return on investment for shareholders, whereas the City of Fayetteville can choose to sell these commodities on the recycling market because of the opportunity to recycle this resource multiple times. In essence, the City would combine economic and environmental benefits instead of just looking at profits. Because the City’s Solid Waste & Recycling Division operates essentially as revenue neutral entity (it only has to generate enough revenue to cover costs) decision makers could feel less pressure to choose short-term profits over long term environmental benefits.

As touched on in the previous chapter, the growing economic demand for these resources will create more pressure on the City to privatize its operations as private companies try to expand their markets. Companies may argue that because Fayetteville is still a relatively small town, the City’s Solid Waste & Recycling Division can’t always tap the same resources to provide identical service as larger entities such as recycling for all multi-family complexes. However, as the City continues to grow in population economies of scale will allow the City to grow its services as well.

As the City of Fayetteville attempts to provide expanded services through increased efficiencies and innovative programs such as the newly adopted apartment recycling program, it should also develop



strategic partnerships with public and private entities to reach economies of scale enabling us to expand recycling services sooner.

Specifically, R.W. Beck outlined several types of agreements that the City could enter into with a private company for recycling services. The three types of agreements that private companies expressed interest in were:

- Processing services agreement. This is where a private processor develops a new facility or upgrades an existing facility to process recyclables. The City would then contract with the facility for processing.
- City ownership with private operation. The City owns the property and structures and possibly the equipment. The processor then operates the facility.
- Contract for design, build and operate. This is where the City owns the land and contracts with a private company to design, build and operate the facility.

In 2010, the University of Arkansas produced almost 4,000 tons of waste while diverting 36% from the landfill. This makes up about 7% of the community's total waste stream. They are currently re-bidding their solid waste services for some of the larger sectors on campus (facilities and housing). A key component of this bid will be the ability to expand recycling opportunities in both sectors to improve the campus diversion rate. They are also very interested in addressing the amount of food waste generated on campus. Facilities Management currently runs a small scale operation that composts about ten tons annually, but with over 125 tons a year produced there is an opportunity to scale up a food composting program immediately. Given these timely factors, the City and University could take advantage of regional discussions around anaerobic digesters to offer food waste collection sooner rather than later.

Marck Industries currently operates an aging material recovery facility (MRF) in Benton County, relying largely on commodities from the recycling services of Waste Management in that area. With its aging infrastructure at the existing MRF there may be an opportunity for a public-private partnership with Marck and the University of Arkansas for a single-stream MRF in Lowell County, following the same recommendation from the R.W. Beck study in 2009. This partnership would allow the City to defray costs of a single-stream MRF, allow the City to offer recycling service to a larger customer base including all multi-family complexes and businesses in Fayetteville, but still keep in tact the curbside collection program that has proven so successful over the past decade.

Ultimately, the City needs to begin thinking strategically about public and private sector partnerships to

advance the services and diversion rate of the community while maintaining the current level of control of waste generated in Fayetteville. These discussions could take different forms, and may not result in partnerships until years later. However, many of the decisions that are made in this field tend to have impacts for five to ten years, such as contract terms or types of equipment purchased.

IV. Summary

- The Solid Waste and Recycling Division operates as an enterprise fund and does not receive sales tax or General Fund revenue.
- The City is required by the state of Arkansas to ensure proper disposal of waste that is generated in the community which allows for more transparent oversight and potential expansion of recycling programs.
- Industry is trending towards greater waste diversion due to recycling commodity values. Including avoided landfill fees, the City of Fayetteville receives \$125.04 per ton of recycling material sold.
- Single-family households and a small number of duplex and multi-family households are collected through a cart based Pay-As-You-Throw (PAYT) automated trash program. PAYT programs are endorsed by the EPA as effective programs designed to reduce waste and promote recycling.
- The Plan is based primarily upon tweaking existing programs in the short term in lieu of doing a more capital intensive investment (i.e single-stream recycling) with appropriate analysis of larger capital investments in mid and long-range goals.
- Short-term diversion rate goals reflect limited ability to expand services under existing operations.
- The City of Fayetteville recently launched its multi-family recycling program and began excepting #3-7 plastics. The City also anticipates opening its second drop-off center in 2012.
- The residential service fee subsidizes commercial recycling.
- Commercial recycling options include curbsort recycling, cardboard, and paper dumpster programs

Recommendations:

- Distributing revenue generated from “solid waste fees” to more accurately reflect use of the revenue stream, including covering expenses for recycling, composting, and bulky waste pickup. Long Range Capital Plan based on clearly defined policy goals from Administration and City Council
- Rate study that develops a service fee for business and apartment recycling and rewards those that



participate in recycling program and reduce number of dumpster pickups per week.

- Full-time education and outreach coordinator focusing 100% of his/her time on increasing participation in existing recycling programs.
- A greater emphasis placed on detailed data collection (survey data by address, multi-family & business separation of data)
- Signage on dumpsters, trash bins, etc to promote recycling efforts.
- The Solid Waste and Recycling Division and Planning Division should develop a process for addressing recycling during the site planning stage.
- Evaluate the existing job position descriptions within the Solid Waste and Recycling Division to make sure they are supporting the goals of the plan; ie: Solid Waste Commercial Representative.

WASTE DIVERSION GOALS

Action Goals

2015 – Diversion Goal = 25%

Projected Operational Cost: \$1.17 million

Potential Diversion Tonnage: 14,630

Potential Diversion Rate: 25%

Potential Revenue & Avoided Tipping Fees: \$1.67 million

- Increase residential participation from 56% to 70%
 - o Rate study that increases difference in bin costs
 - o Hire full-time education/outreach person
 - o Improve survey data to better target underperforming neighborhoods
 - o Improve signage on trash bins
 - o Purchase one additional recycling truck and two additional employees
 - o Develop capital plan
- Provide recycling to 30% of apartment units in Fayetteville
 - o Make recycling available to all complexes with over 250 units
 - o Consistent outreach and improved signage on dumpsters
 - o Reward complexes that reduce number of dumpster pickups per week by reducing their rate
 - o Begin devising plan for providing recycling to apartments with 100 units or more
- Increase business participation from 6% to 25%
 - o Rate study for PAYT style system for businesses
 - o Dickson Street recycling program or other restaurant clusters
 - o Actively promote recycling program and sign up businesses
- Expand drop-off program to three locations



Survey for Residents with Access to Curbside Recycling Page One

Thank you for taking this 4 minute survey. Your input is important and will help the City of Fayetteville's Solid Waste & Recycling Division to guide the emphasis and direction of the current recycling program.

1. Do you currently recycle? *

- ☐ Yes
☐ No

2. If you do not recycle put a checkmark next to the reasons why:

- ☐ I have a lack of storage space
☐ I don't know what I can recycle
☐ It takes too much time to recycle
☐ I'm not interested in recycling
☐ It doesn't make a difference anyway
☐ Other

3. If you do recycle, what materials are you more likely to recycle? Please list.

2020 – Diversion Goal = 30%

Projected Operational Cost: \$2.82 million

Potential Diversion Tonnage: 23,600

Potential Diversion Rate: 41%

Potential Revenue & Avoided Tipping Fees: \$3.98 million

- Improve residential participation from 70% to 80%
 - o Continued outreach and education utilizing improved survey data
 - o Reach out to vendor community to discuss increased producer responsibility
 - o Promote corporate take-back programs
- Provide recycling to all apartment complexes with over 100 units
 - o Purchase or build bins that can service these complexes
- Improve business participation from 25% to 50%
 - o Continued outreach & education using improved survey and business registry data
 - o Analysis of participating businesses and reconfiguring business recycling programs to fill gaps in services offered
- Hire consultant to analyze potential for organic collection and construction & demolition recycling
- Perform mandatory reassessment of Solid Waste and Recycling Resource Management Plan in 2017



Vision Goals

2030 – Diversion Goal = 60%

Potential Diversion Tonnage: 46,000

Potential Diversion Rate: 80%

Potential Revenue & Avoided Tipping Fees: \$4.61 million

- Mandatory recycling for residential, apartments, and businesses
- Collect organic materials from residential and businesses
- Construction & Demolition waste collection



APPENDIX A

Public Input

As with any project the City embarks on, public input has been crucial to the development of this plan, in particular, in creating goals that inform the policies and actions to achieve the public's vision.

Survey Results:

The project team began collecting public input early in the plan process. Three separate surveys were developed with questions for three groups of citizens based on their specific solid waste services. One was developed for those who have access to curbside pickup, typically single family residents, another for multifamily (apartment) dwellers, and the last was for apartment managers and business management and owners. The surveys were hand distributed and online during the months of July and August, and had a successful response rate of over 523 participants. A total of 393 respondents filled out the single family survey, 98 completed the apartment survey, and 32 completed the business/apartment manager survey. Questions focused on recycling habits and preferences, materials recycled, and ways the program could be improved or expanded.

In an open ended question residential participants were asked to list the items they are more likely to recycle. Plastic was the most listed item, followed in order by glass, cardboard, paper and aluminum cans. Steel cans, magazines, newspaper and mixed paper, cardboard and chipboard, and food and yard waste were all listed multiple times, but didn't rank as highly.

Plastic	59%
Glass	54%
Cardboard	51%
Paper	45%
Aluminum Cans	44%

These results are backed with the results of another open-ended question that asked single family residents for suggestions on improvements to the current recycling program. The most frequent comment, made by about 25% of the respondents, was that they would like to see a wider range of plastics accepted. Other top responses included that the recycling bins could be increased in size and have a way for residents to better separate their materials. Some would like to see more materials such as batteries, light bulbs, plastic bags, etc. accepted, and multiple people said that they appreciated the services offered and saw little need for improvement. Several people also mentioned the need for recycling education, a better system for recycling different paper types, streamlining the process and making it easier to recycle and more recycling options for commercial entities.

The survey also acknowledges that food waste is another major component of the waste stream that needs to be addressed. When asked if

APPENDIX A

they were interested in learning more about food composting, 56% of single family residents said yes, while 41% of single family residents, and 57% of apartment residents said they would be interested in subscribing to a food scrap pick-up service if one were made available in the future.

Residents in apartments were asked if they would utilize recycling if it were made available at their apartment, and 76% said yes, even if the bin were more than 100 feet away. Of those that said yes, 68% said they would be willing to pay an extra amount to cover the recycling charges.

Businesses that participated in the survey ranged from apartment companies to restaurants and bars, retail, various types of business offices and a library. Only 7% noted that they did not recycle due to the fact that it was not available to them. Those businesses that reported participation in the program recycle all types of accepted materials, with cardboard as the most frequently recycled, followed by glass, newspaper, mixed paper and chipboard and plastics.

When voicing concern about recycling, many in this group commented on the need for education in order to get businesses and apartment residents to participate in a recycling program. Multiple people voiced a need for large scale glass recycling in business districts but also stated a concern for a lack of storage space for recycling.

APPENDIX B

Follow this link to find a see a supplemental spreadsheets containing a breakdown of recycling materials, tonnages, program costs and revenues.